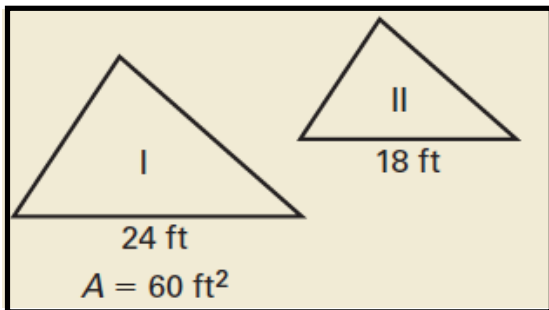


Bellwork
04/17/12

1. Use Figure I~Figure II to find the ratio of the sides. Then find the unknown area.



$$24:18$$

$$4:3 \quad 16:9$$

$$\frac{16}{9} = \frac{60}{x}$$

$$16x = 540$$
$$x = 33.75 \text{ ft}^2$$

Geometry

11.4 Circumference and Arc Length

Standard(s): 4, 6

Vocabulary:

Arc Length: A portion of the circumference of a circle.

Note: the measure of the arc (in degrees) can be used to find the length (in units).

Circumference: The distance around a circle.

Note: We no longer use 3.14 as Pi. You will use the π button on your calculator.

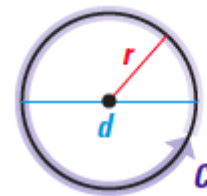
THEOREM

For Your Notebook

THEOREM 11.8 Circumference of a Circle

The circumference C of a circle is $C = \pi d$ or $C = 2\pi r$, where d is the diameter of the circle and r is the radius of the circle.

Justification: Ex. 2, p. 769



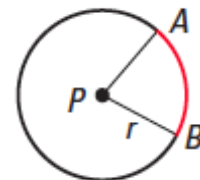
$$C = \pi d = 2\pi r$$

COROLLARY

For Your Notebook

ARC LENGTH COROLLARY

In a circle, the ratio of the length of a given arc to the circumference is equal to the ratio of the measure of the arc to 360° .



$$\frac{\text{Arc length of } \widehat{AB}}{2\pi r} = \frac{m\widehat{AB}}{360^\circ}, \text{ or Arc length of } \widehat{AB} = \frac{m\widehat{AB}}{360^\circ} \cdot 2\pi r$$

Find Indicated Measures

Find the indicated measure.

1. Radius of a circle with circumference 36 ft.

$$C = 2\pi r$$

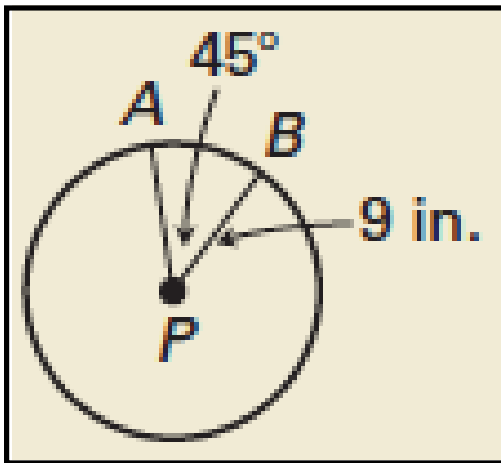
$$\frac{36}{2\pi} = \frac{\cancel{2\pi}r}{\cancel{2\pi}}$$

$$r = \frac{36}{2\pi}$$

$$r = \frac{18}{\pi} \approx 5.7 \text{ ft.}$$

Find Arc Lengths

Find the length of arc \widehat{AB} .



$$C = 2r\pi$$

$$C = 2(9)\pi$$

$$C = 18\pi$$

$$\widehat{AB} = \frac{45}{360} \cdot \frac{18\pi}{1}$$

$$\widehat{AB} = \frac{1}{8} \cdot \frac{18\pi}{1}$$

$$\widehat{AB} = \frac{18\pi}{8}$$

$$\widehat{AB} = \frac{9\pi}{4}$$

$$\approx 7.1 \text{ in.}$$

Use Central Angles

In circle D, $\angle ADC \cong \angle BDC$. Find the indicated measure.

$$m\widehat{ACB}$$

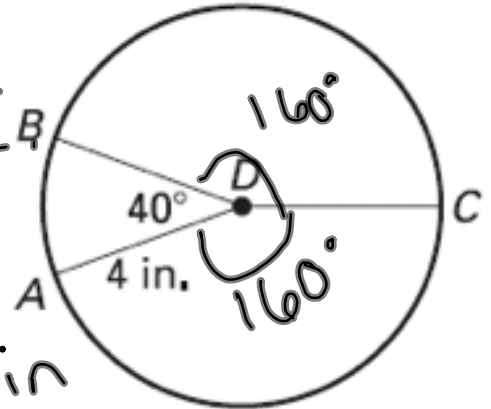
$$320^\circ$$

Length of \widehat{ACB}

$$\widehat{ACB} = \frac{320}{360} \cdot \frac{8\pi}{1}$$

$$\frac{64\pi}{9}$$

$$\approx 22.3 \text{ in}$$



$$m\widehat{CB}$$

$$160^\circ$$

Length of \widehat{CB}

$$\widehat{CB} = \frac{160}{360} \cdot \frac{8\pi}{1}$$

$$C = 2(4)\pi$$

$$C = 8\pi$$

$$m\widehat{ABC}$$

$$200^\circ$$

$$= \frac{32\pi}{9}$$

$$\approx 11.2 \text{ in}$$

Length of \widehat{BAC}

$$\widehat{BAC} = \frac{200}{360} \cdot \frac{8\pi}{1}$$

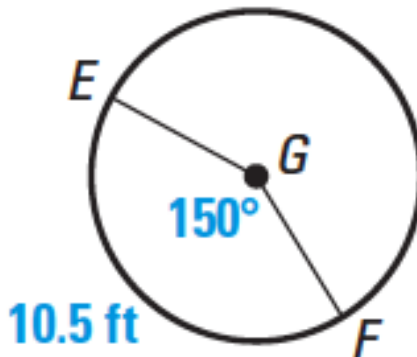
$$= \frac{40\pi}{9}$$

$$\approx 14 \text{ in}$$

Use Arc Lengths

Find the indicated measure.

Radius of circle G



$$10.5 = \frac{150}{360} \cdot 2\pi r$$

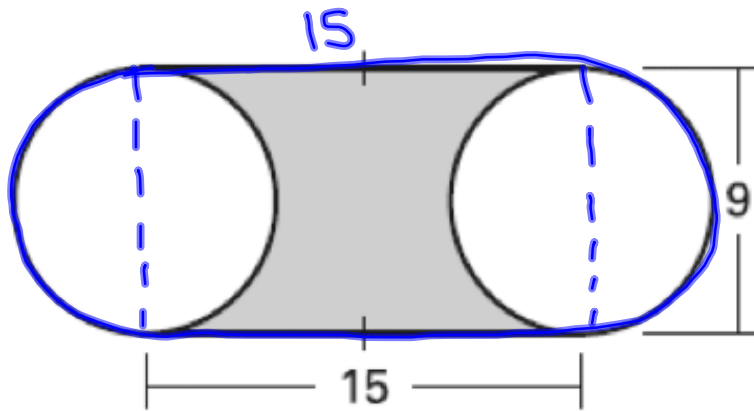
$$10.5 = \frac{300\pi}{360} \cdot r$$

$$\frac{6}{5\pi} \cdot \frac{10.5}{1} = \frac{5\pi}{6} \cdot r \cdot \frac{6}{5\pi}$$

$$r = \frac{63}{5\pi} \approx 4.01 \text{ ft.}$$

Find Perimeter

Find the perimeter of the region.



$$C = d\pi$$

$$C = 9\pi$$

$$15 + 15 + 9\pi$$

$$30 + 9\pi$$

$$P = 58.3 \text{ un.}$$

Homework Assignment

Worksheet 11.4C

